

logical conditions is duly considered, and Mr. Havelock Ellis summarises his conclusions as follows:—

“We cannot, therefore, regard genius either as a purely healthy variation occurring within normal limits, nor yet as a radically pathological condition, not even as an alternation—a sort of allotropic form—of insanity. We may rather regard it as a highly sensitive and complexly developed adjustment of the nervous system along special lines, with concomitant tendency to defect along other lines. Its elaborate organisation along special lines is often built up on a basis even less highly organised than that of the average man. It is no paradox to say that the real affinity of genius is with congenital imbecility rather than with insanity.”

The criticism will doubtless be made that in many cases the individuals dealt with by Mr. Ellis are too few in number to give trustworthy results; but this is a matter that was beyond his control, and no one can say that he has not made the most of available material.

#### TEXT-BOOKS OF PHYSICAL CHEMISTRY.

*Introduction to the Study of Physical Chemistry.* By Sir William Ramsay, K.C.B., F.R.S. Pp. 48. (London: Longmans, Green and Co., 1904.) Price 1s. net.

*The Phase Rule and its Applications.* By Alex. Findlay, M.A., Ph.D., D.Sc. Pp. lxiv + 313. (London: Longmans, Green and Co., 1904.) Price 5s.

IT will be readily admitted that there is on the part especially of our younger chemists, a growing appreciation of the methods and results of physico-chemical investigation, and the issue of a series of text-books of physical chemistry under the able supervision of Sir William Ramsay will be a welcome stimulus to the prosecution of study and research on these lines. Dr. Findlay's book on the phase rule is the first of the series, and other volumes are promised, dealing respectively with stoichiometry, relation between chemical constitution and physical properties, electrochemistry, spectroscopy, thermodynamics, chemical dynamics and reactions. The advance being made in some of these departments is much more rapid than in others, and the plan of having a volume for each branch of the subject will make frequent revision possible where there is a call for it.

Taken altogether, these volumes will be an acceptable addition to our chemical literature, for up to now the English student of physical chemistry has been dependent chiefly on translated text-books for detailed treatment of certain advanced portions of the subject. One or two of the promised volumes, it is true, will cover well trodden ground, but they are requisite in the interests of the treatise as a whole, and the editor will doubtless see that harmony and uniformity are preserved in the several parts. He has written a general introduction to the series, giving a rapid survey of the main lines along which the development of physical chemistry has proceeded, and indicating the scope of the subjects to be dealt with in the special volumes.

The mere mention of the phase rule usually strikes dismay in the heart of the non-mathematical chemist,

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but it may be said at once that Dr. Findlay's treatment of the subject is almost entirely descriptive. The phase rule can be formulated in a simple enough manner, and its application can be appreciated even by those who may not feel at home with Willard Gibbs. Its merit is that it has rendered possible the classification of the various kinds of equilibria on a rational and scientific basis. The parallelism between many cases of physical and chemical equilibrium becomes intelligible; the phenomena of polymorphism, as exhibited, for example, by sulphur, tin, and benzophenone, can be treated systematically, and the conditions of stability of various polymorphic forms can be definitely formulated; the equilibrium between solid and liquid in binary systems can be fully interpreted, even when the two components form mixed crystals. In the exposition of these and many other points Dr. Findlay has done excellent work, and he has succeeded in producing an interesting and comprehensive estimate of the value of the phase rule in the classification and interpretation of equilibrium phenomena.

It is a very gratifying feature of the book that it contains full and up to date references to original work, and it is to be hoped that this feature will be prominent also in the subsequent volumes. After all, the best text-book can serve only to introduce the student to the actual workers in his science, and the more of such contact the better. Dr. Findlay has very properly been liberal in the reproduction of figures, for the exposition of the phase rule would be a difficult task indeed without those graphical methods of representation that have been so characteristic of its application. Tables of numerical data, taken from original papers, are abundant, and assist materially in the realisation of the actual experimental groundwork.

As a result of the physicochemical activity of the last twenty years, and of the corresponding introduction of mathematical methods of treatment, more demands than formerly are made on the reasoning powers of the chemical student. This is probably true also in connection with the phase rule, but no one who considers the material collected by Dr. Findlay will doubt that the application of these exact methods has secured a rich harvest of coordinated knowledge.

J. C. P.

#### OUR BOOK SHELF.

*Notes on Electric Railway Economics and Preliminary Engineering.* By W. C. Gotshall. Pp. iv + 251. (New York: McGraw Publishing Co., 1903.)  
*Engineering Preliminaries for an Interurban Electric Railway.* By E. Gonzenbach. Pp. 71. (New York: McGraw Publishing Co., 1903.)

THE economic side of engineering is one which the student is generally left to pick up as best he can on his way through life. Little attention is paid to it as a rule in the course of his technical training, and it is not until he starts on practical commercial work that he begins to realise that pounds, shillings and pence enter as much into the engineer's formulæ as the fundamental units of length, mass and time. These two books should be very useful, therefore, not only to the budding electric railway engineer, but also to all students of engineering, as serving to show the many

things needed besides technical knowledge to make a good engineer.

Mr. Gotshall's work is distinctly the more ambitious of the two, in that it seeks rather to point out the general principles applicable to all cases of electric railway projection, whereas Mr. Gonzenbach confines himself to the consideration in outline of a particular case. The student will derive from Mr. Gotshall's book a good idea of the importance of every detail in the original scheme, and will see how greatly the operating costs and the dividends may be affected by careful design throughout. He will also be able to glean some useful hints on the methods of dealing with promoters, landowners, and so forth, with whom, if he is ever called upon to draw up a scheme for an electric railway, he is likely to have much to do. Many of the details and particulars in both books are naturally not applicable to this country, but this does not materially detract from their value. M. S.

*The Pests and Blights of the Tea Plant.* Second edition. By Sir G. Watt and H. H. Mann. Pp. xv+429. (Calcutta, 1903.)

THIS work first appeared in 1898 as a report of particular investigations on tours, but is now a large volume of more than 400 pages, with numerous illustrations. The amount of information collected is enormous, and one may understand that no tea-planter can dispense with the work, the more so since such subjects as hybridisation and the different races of tea seed, weeding, tilling and cultural operations generally, drainage and manuring of tea, pruning and plucking, &c., are fully dealt with, in addition to the enumeration and description of the multitude of insect and fungus enemies which the long suffering shrub harbours.

By means of conspicuous marginal notes the authors have undone most of the disadvantages inevitable from their general method of lumping together scraps of information derived from all kinds of sources, the relative value of which, moreover, is generally capable of being sifted because the references are given; in spite of this, however, and indispensable as the encyclopaedic information is, we think much might be done in improving the style if the materials were better woven into a more narrative and continuous form. Why is it that the introductory sections on general physiology of plants—the fundamental study without which the sequel is useless—are so often badly done in such works as this? Does it mean that the great schools of science have even yet not impressed their learning on the officials entrusted with such important treatises, or is it that an older generation of workers not familiar with modern researches dominates the situation?

*Highways and Byways in Sussex.* By E. V. Lucas. With illustrations by Frederick L. Griggs. Pp. xx+416. (London: Macmillan and Co., Ltd., 1904.) Price 6s.

MR. LUCAS himself aptly describes his book. He tells the reader:—"My aim has been to gather a Sussex bouquet rather than to present the facts which the more practical traveller requires," and he has succeeded in writing a delightful, chatty account of a county in which Londoners have an especial interest. The history, architecture and folk-lore, the animal and plant life of the county, and the customs and characteristics of the people are all noticed by Mr. Lucas and skilfully woven into a pleasing narrative. The illustrations, of which there are nearly eighty, are excellent, and add greatly to the charm of the book.

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#### LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

#### Learned Societies.

THERE are two other defects of the present system of reporting on papers to which I desire to direct attention. In the first place there are certain mathematicians who resemble the Athenians in the time of St. Paul, who "spent their time in nothing else, but either to tell, or to hear some new thing." They are consequently averse to reporting in favour of a paper unless it contains new results. Against this excessive craving after novelty I emphatically protest. Many interesting results frequently drop out incidentally in the course of a long and complicated investigation, whilst others have been originally obtained by some cumbrous, troublesome and antiquated process,<sup>1</sup> and in my judgment a paper which supplies concise, simplified and improved demonstrations of results of this character is quite as valuable as one which is devoted to the investigation of new results.

In the next place, as a general rule, none of the councillors present have read the paper unless any of them happen to be referees. Moreover, a good many of the councillors present, even if they had tried to understand the paper, would be quite incapable of expressing an opinion as to its merits, and I well recollect that I myself have sometimes experienced considerable embarrassment when invited to vote officially as a councillor against the publication of a paper which lay outside my own line of reading, and I have sometimes got over the difficulty by abstaining from voting.<sup>2</sup>

I regard Prof. Bryan's suggestions as altogether impracticable. In the first place no person possessing ordinary common sense would run the risk of adverse criticism by consenting to report on a paper relating to a subject with which he was only slightly acquainted. In the next place no author, except a very junior one, would consent to subject his papers to the extensive revision, which Prof. Bryan appears to contemplate, at the suggestion of an *unknown* and possibly a very junior referee. He would probably regard such suggestions as a piece of impertinence (and I recollect one such case in connection with a foreign mathematician), and he would make short work of them by insisting on the society printing his paper as it stands or returning the manuscript for publication elsewhere.

I believe that every Royal Academician possesses the privilege of hanging a certain number of his pictures every year, and I see no reason why a similar privilege should not be extended to members of learned societies with regard to the publication of their papers.

A. B. BASSET.

Fledborough Hall, April 16.

#### Department of International Research in Terrestrial Magnetism of the Carnegie Institution.

THE trustees of the Carnegie Institution at their annual meeting last December authorised the establishment of what is to be known as the "Department of International Research in Terrestrial Magnetism." An allotment of twenty thousand dollars was made with the expectation that if the proposed work should be successfully organised, a similar sum would be granted annually for the period requisite to carry out the plan submitted by the writer, as endorsed by leading investigators, and published in "Year-book" No. 2 of the Carnegie Institution.

The undersigned has been appointed director of the department, and has been given full authority to organise it, beginning with April 1. Arrangements have also been made so that the magnetic survey and magnetic observatories of the United States, conducted under the Coast and Geodetic Survey, will remain in his charge as heretofore.

<sup>1</sup> The method by which Euler's equations for the rotation of a rigid body used to be proved is an example.

<sup>2</sup> A very glaring example of the imperfections of the present system will be found in the *Phil. Trans.*, A. 1892, in connection with Mr. J. J. Waterston's paper.